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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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PATENT DEPARTMENT  
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EXAMINER

KRISHNAN, GANAPATHY

ART UNIT PAPER NUMBER

1623

DATE MAILED: 08/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/856,545

Applicant(s)

SCHLESIGER, HARTWIG

Examiner

Ganapathy Krishnan

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.

- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 4, 5, 6 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites “an aqueous solution of hydrogen peroxide, the portions of the mixture being selected in such a way that the hydrogen peroxide content is 0.1-10 wt. % in relation to dry cellulose ether...”. It is not clear what “portions of the mixture being selected” means. If the amount of hydrogen peroxide in the mixture of Claim 1 is to be in the range of 0.1-10 wt. % in relation to the amount of cellulose ether then Claim 1 step (a)-(ii) should be restated as “an aqueous solution of hydrogen peroxide which is 0.1-10 wt. % in relation to the dry weight of the cellulose ether”. Otherwise, Claim 1 (a) (ii) as stated is confusing and everything should be removed except “an aqueous solution of hydrogen peroxide”.

Claim 2 recites “wherein mixing with the aqueous hydrogen peroxide solution is carried out step-by-step”. It is not clear what is meant by this phrase. If addition of the aqueous hydrogen peroxide solution to the cellulose ether is done in small portions then it should be restated “wherein the addition of aqueous hydrogen peroxide to the mixture is done in portions”. If not, Claim 2 should be removed, as it is not clear what is being claimed.

Claim 4 recites, “wherein 0.1 to 10 wt. % of hydrogen peroxide in relation to the dry cellulose ether is used.” Since the same recitation is also present in Claim 1, Claim 4 as stated

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fails to further limit Claim 1. It is not clear what is claimed in Claim 4. Claim 4 should be cancelled or should be restated to further limit Claim 1.

Claim 5 and 12 recite, "wherein a higher-molecular cellulose ether". It is not clear what is meant by "higher-molecular cellulose ether". There is also lack of antecedent basis for "higher-molecular cellulose ether". If higher-viscosity cellulose ether is intended, it should be stated "higher-viscosity cellulose ether" instead of "higher-molecular cellulose ether".

Claims 5 and 12 also recite "with a solid content" of 35-80 wt. % and 40-55 wt. % respectively, in relation to cellulose ether and solvent, is used. It is not clear what is meant by solid content.

Claim 6 recites "by mixing it with an aqueous solution". It is not clear what is meant by this phrase. The metes and bounds are not defined. It does not state what else the aqueous solution referred to in that phrase contains if hydrogen peroxide is optional.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Angerer et al (USPN 5,480,984) in combination with Hilbig et al (USPN 5,708,162) and Gill (953944).

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Claims 1-13 are drawn to a process for the production of low-viscosity water-soluble cellulose ethers by oxidative decomposition of higher-viscosity cellulose ethers by forming a mixture at 65-125°C comprising higher-viscosity cellulose ethers and aqueous hydrogen peroxide with a hydrogen peroxide content of 0.1-10 wt. % relative to dry cellulose ether and a solid content of the mixture being 25 wt. % relative to the total quantity of the mixture; agitating the mixture continuously at the said temperature until approximately at least 90% of hydrogen peroxide has been spent; wherein the mixture is agitated continuously at temperatures of 75-100 °C; wherein the pH of the mixture is set at more than 4.5; wherein the water soluble cellulose is selected from carboxymethyl cellulose, hydroxyethyl carboxymethyl cellulose, sulfoethyl cellulose, hydroxyethyl sulfoethyl cellulose, hydroxyethyl cellulose, methyl cellulose, methylhydroxyethyl cellulose, methylhydroxyethyl sulfoethyl cellulose, methylhydroxypropyl cellulose, hydroxypropyl cellulose, hydrophobically modified forms of these and mixtures thereof; water –wet filter cakes of above mentioned celluloses; wherein 0.2 to 2.5 wt. % of hydrogen peroxide relative to dry cellulose ether is used; a higher-molecular cellulose ether with a solid content of 40 to 55 wt. % in relation to total quantity of cellulose ether and solvent is used; the process where the pH is 6 to 7.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Angerer et al teach a process for producing low viscosity water-soluble polysaccharide products via the oxidation of cellulose ethers (with percent solids greater than 5%) with aqueous hydrogen peroxide as the oxidizing agent (see entire document). The oxidative decomposition is carried out by heating a mixture of the cellulose ether and hydrogen peroxide in water at 80 °C, with continuous agitation. The oxidative decomposition is also carried out by adding a mixture of peroxide and cellulose ether in stages. The percentage of hydrogen peroxide used is also in the range instantly claimed. Since the reaction is performed in aqueous solution, the pH of the mixture should be close to 7 (see Examples 1-4). The polysaccharide decomposed in the reaction is chosen from a wide variety of cellulose ethers and hydrophobically modified varieties of them (see col. 6. claim 4).

However, Angerer et al do not explicitly say that the starting cellulose ethers of their invention have a high viscosity and also do not teach the oxidative decomposition of water-wet filter cakes of the cellulose ethers.

Gill teaches (see entire document) reduction of viscosity of water-soluble cellulose ethers using aqueous hydrogen peroxide in the temperature range 70-100 °C (see table 1, page 3 and examples) at a pH of between 5 and 9 (see claim 8, page 4).

Hilbig et al teach the oxidative degradation of high viscosity polysaccharides using perborate as the oxidizing agent, to give low-viscosity polysaccharides (see col.3. lines 36-52; col. 7, lines 40-48 and Examples 2-8). Even though perborate is used as the oxidizing agent in this invention, the same results can be achieved with hydrogen peroxide.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Angerer and Hilbig to produce low-viscosity cellulose

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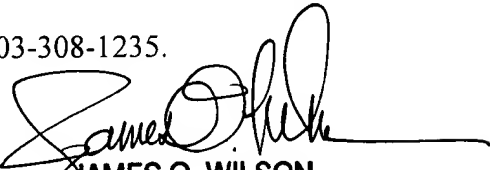
ethers via the oxidative degradation of high-viscosity cellulose ethers using hydrogen peroxide as the oxidizing agent, since the methods and reagents of the instantly claimed process is set forth in the prior art cited above. The processes mentioned in the prior art can also be modified by one of ordinary skill in the art, with regard to order of steps, amount of reagents and reaction conditions, to produce low-viscosity ethers as instantly claimed. It could also be used to oxidatively decompose water-wet filter cakes of the cellulose ethers.

One of ordinary skill in the art would be motivated to do so because the processes mentioned in the prior art are fairly simple to carry out using conventional equipment even on a large scale and do not involve tedious steps. The starting materials are also readily available. The process of Angerer is also preferable because it involves the use of water as solvent, which is easy to handle. Since the process uses aqueous hydrogen peroxide, which is almost totally consumed during the reaction, isolation and purification of the product is simple and disposal of waste is not a problem as no toxic organic solvents or catalysts are used.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ganapathy Krishnan whose telephone number is 703-305-4837. The examiner can normally be reached on 8.30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 703-308-4532. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1235.



JAMES O. WILSON  
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